Listing of Claims

1. (Original) A method of modifying a nucleic acid molecule comprising; contacting the nucleic acid molecule with a prokaryotic DNA repair ligase polypeptide.

2. (Original) A method according to claim 1 wherein the prokaryotic DNA repair ligase polypeptide comprises one or more of: a primase domain, a nuclease domain, and a ligase domain, said one or more domains sharing greater than 20% sequence identity with the corresponding domain sequence of Mt-Lig (CAB08492).

3. (Currently Amended) A method according to claim 1 ~~or claim 2~~ wherein the prokaryotic DNA repair ligase polypeptide shares greater than 20% sequence identity with the sequence of Mt-Lig (CAB08492).

4. (Currently Amended) A method according to ~~any one of claims~~claim 1 ~~to 3~~ wherein the prokaryotic DNA repair ligase polypeptide is Mt-Lig (CAB08492) or a variant or allele thereof.

5. (Currently Amended) A method according to ~~any one of the preceding claims~~claim 1 wherein the nucleic acid molecule and the Mt-Lig polypeptide are contacted in the presence of a prokaryotic Ku polypeptide.

6. (Original) A method according to claim 5 wherein the prokaryotic Ku polypeptide shares greater than 20% sequence identity with the sequence of Mt-Ku (CAB08491).

7. (Original) A method according to claim 6 wherein the prokaryotic Ku polypeptide is Mt-Ku (CAB08491) or an allele or variant thereof.

8. (Currently Amended) A method of ligating nucleic acid molecule ends comprising;:

contacting a first nucleic acid end and a second nucleic acid end with ~~an~~ prokaryotic DNA repair ligase polypeptide,

wherein said first and said second nucleic acid ends are non-compatible.

9. (Original) A method according to claim 8 wherein said first and said second nucleic acid ends comprise non-complementary overhang regions.

10. (Currently Amended) A method according to claim 8 ~~or claim 9~~ wherein the first end is on a first nucleic acid molecule and the second end is on a second nucleic acid molecule.

11. (Original) A method according to claim 10 wherein the first and second nucleic acid molecules are DNA.

12. (Original) A method according to claim 10 wherein the first nucleic acid molecule is DNA and the second nucleic acid molecule is RNA.

13. (Currently Amended) A method according to claim 8 ~~or claim 9~~ wherein the first and second ends are on the same nucleic acid molecule.

14. (Currently Amended) A method according to ~~any one of claims~~claim 8 ~~to 13~~ further comprising isolating and/or purifying the ligated nucleic acid molecule.

15. (Currently Amended) A method of labelling a nucleic acid molecule comprising~~;~~ :

contacting a nucleic molecule having a first terminus with an prokaryotic DNA repair ligase polypeptide in the presence of labelled nucleotides.

16. (Original) A method according to claim 15 wherein the nucleotides are NTPs.

17. (Original) A method according to claim 15 wherein the nucleotides are dNTPs.

18. (Currently Amended) A method of filling in a single stranded gap in a double stranded nucleic acid molecule comprising~~;~~:

contacting a double stranded nucleic acid molecule having a single stranded region with an prokaryotic DNA repair ligase polypeptide.

19. (Original) A method according to claim 18 wherein said nucleic acid molecule and said prokaryotic DNA repair ligase polypeptide are contacted in the presence of NTPs.

20. (Original) A method according to claim 18 wherein said nucleic acid molecule and said prokaryotic DNA repair ligase polypeptide are contacted in the presence of dNTPs.

21. (Currently Amended) A method of removing a single stranded overhang from the end of a nucleic acid molecule comprising~~;~~:

contacting said nucleic acid molecule with a prokaryotic DNA repair ligase polypeptide

22. (Original) A method according to claim 21 wherein the prokaryotic DNA repair ligase polypeptide is an Mt-Lig polypeptide.

23. (Currently Amended) A method according to claim 21 ~~or claim 22~~ wherein said nucleic acid molecule is contacted in the presence of Mg^{2+} or Mn^{2+}.

24. (Currently Amended) A method of producing an RNA molecule comprising~~;~~:

contacting a prokaryotic DNA repair ligase polypeptide and a template DNA strand in the presence of NTPs.

25. (Original) A method according to claim 24 wherein prokaryotic DNA repair ligase and template DNA are contacted in the presence of a primer oligonucleotide.

26. (Currently Amended) A method of producing an DNA molecule comprising~~;~~:

contacting A prokaryotic DNA repair ligase polypeptide and a nucleic acid template in the presence of dNTPs and a primer oligonucleotide.

27. (Original) A method according to claim 26 wherein the nucleic acid template is an RNA template.

~~29~~28. (Currently Amended) A method according to ~~any one of claims~~claim 8 ~~to 28~~ wherein the prokaryotic DNA repair ligase polypeptide comprises one or more of: a primase domain, a nuclease domain, and a ligase domain, said one or more domains sharing greater than 20% sequence identity with the corresponding domain sequence of Mt-Lig (CAB08492).

~~30~~29. (Currently Amended) A method according to ~~any one of claims~~claim 8 ~~to 29~~ wherein the prokaryotic DNA repair ligase polypeptide shares greater than 20% sequence identity with the sequence of Mt-Lig (CAB08492).

~~31~~30. (Currently Amended) A method according to ~~any one of claims~~claim 8 ~~to 30~~ wherein the prokaryotic DNA repair ligase polypeptide is Mt-Lig (CAB08492) or a variant or allele thereof.

~~32~~31. (Currently Amended) A method according to ~~any one of claims~~claim 8 ~~to 31~~ wherein the nucleic acid molecule and the Mt-Lig polypeptide are contacted in the presence of a prokaryotic Ku polypeptide.

~~33~~32. (Currently Amended) A method according to claim ~~32~~ 31 wherein the prokaryotic Ku polypeptide shares greater than 20% sequence identity with the sequence of Mt-Ku (CAB08491).

~~34~~33. (Currently Amended) A method according to claim ~~32~~ 31 ~~or claim 33~~ wherein the prokaryotic Ku polypeptide is Mt-Ku (CAB08491) or an allele or variant thereof.

~~35~~34. (Currently Amended) A kit comprising an isolated Mt-Lig polypeptide for use in a method according to ~~any one of claims~~claim 1 ~~to 34~~.

~~36~~35. (Currently Amended) A kit according to claim ~~35~~ 34 comprising an isolated Mt-Ku polypeptide.

~~37~~36. (Currently Amended) A kit according to claim ~~35~~34 ~~or claim 36~~ comprising dNTPs.

~~38~~37. (Currently Amended) A kit according to claim ~~35~~ 34 ~~or claim 36~~ comprising NTPs.

~~39~~38. (Currently Amended) A kit according to ~~any one of claims~~claim 34 ~~35 to 38~~ comprising one or more of buffers, stabilisers and excipients.

~~40~~39. (Currently Amended) A method of producing ~~an~~a prokaryotic DNA repair polypeptide comprising~~;~~:

(a) causing expression from nucleic acid which encodes a prokaryotic DNA repair polypeptide in a suitable expression system to produce the polypeptide recombinantly; and,

(b) testing the recombinantly produced polypeptide for prokaryotic DNA repair activity.

~~41~~40. (Currently Amended) A method according to claim ~~40~~ 39 wherein the recombinantly produced polypeptide is tested for one or more of: non-complementary end ligation activity, DNA dependent RNA primase activity, 3'-5' exonuclease activity, DNA and RNA dependent DNA polymerase activity, DNA dependent RNA polymerase activity, ATP dependent DNA and RNA ligase activity and DNA terminal transferase activity.

~~42~~41. (Currently Amended) A method according to claim 39 ~~or 40~~ wherein the prokaryotic DNA repair polypeptide is an Mt-Lig polypeptide or an allele or variant thereof.

~~43~~42. (Currently Amended) A method according to ~~any one of claims~~claim 39 ~~to 41~~ comprising purifying said recombinantly produced polypeptide.

43. (New) A method according to claim 26 wherein the nucleic acid template is a DNA template.